**Fig. 1**

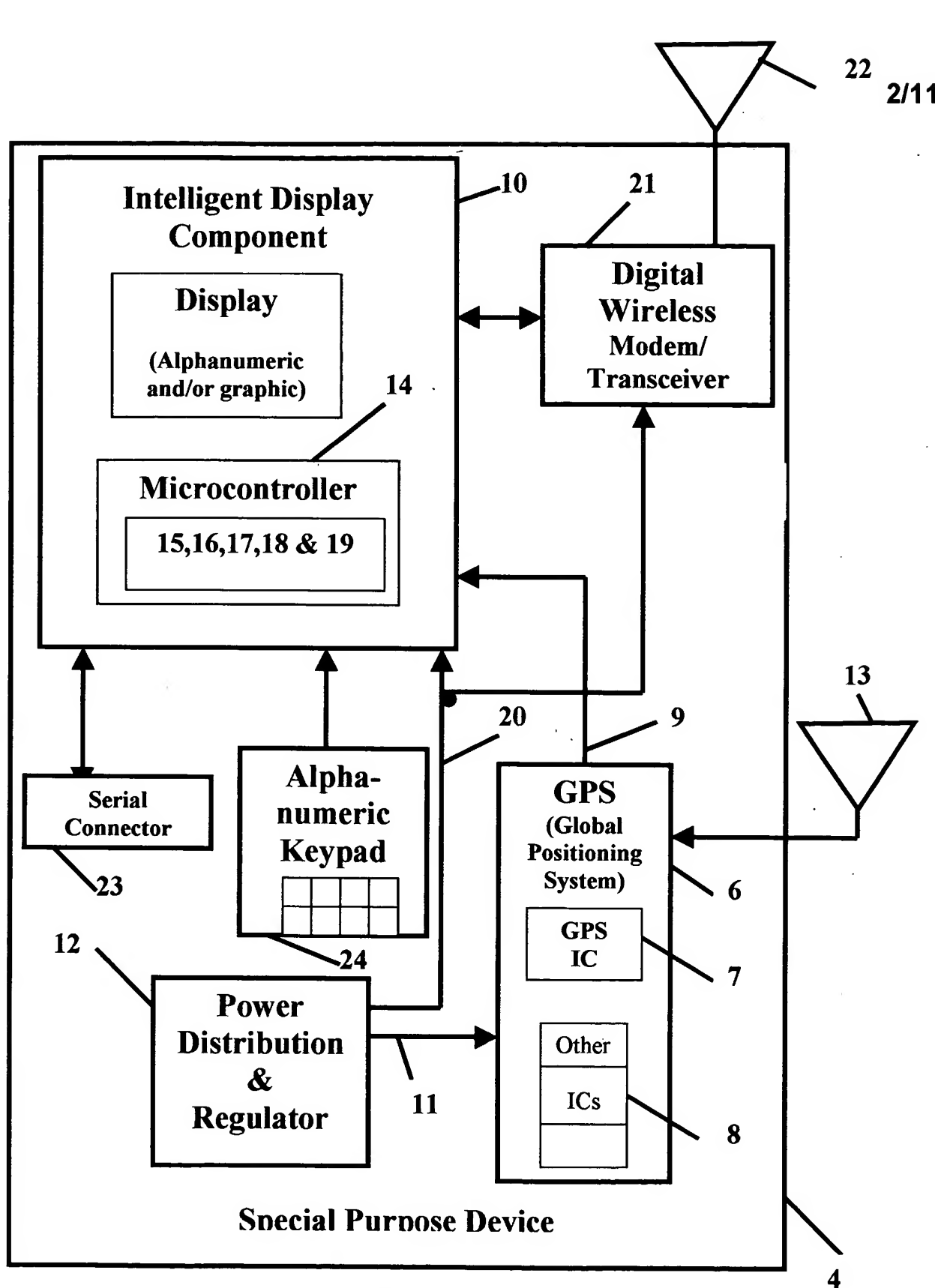


Fig. 2

| | | | |
|---|--|---------------------------------|--|
| Mariner Keypad or On-board Sensor Initiated Transmissions | | | |
| Emergency Key (E) with example codes for type of emergency. | | | |
| Transmissions alternatively initiated automatically by sensors noted with "***" | | | |
| <u>Code</u> | | <u>Condition</u> | |
| 1 | | Man Overboard | |
| 2 | | Engine fire* | |
| 3 | | Explosion or Collision* | |
| 4 | | Heart failure | |
| 5 | | Excessive Bleeding | |
| 6 | | Unconscious Passenger | |
| 7 | | Taking on water - high rate* | |
| 8 | | Concussion | |
| 9 | | Other serious injury | |
| 0 | | Vessel at site of emergency | |
| A | | Smoke - black* | |
| B | | Smoke - blue* | |
| C | | Smoke - gray* | |
| D | | Lost night lights* | |
| * | | Excessive Throttle Position | |
| E | | Suspicious vessel nearby | |
| Service Request Key (S) with example codes for type of service. | | | |
| <u>Code</u> | | <u>Condition</u> | |
| 1 | | Engine stall - need mech or tow | |
| 2 | | Out of fuel - gasoline | |
| 3 | | Out of fuel - diesel | |
| 4 | | Run aground - tow | |
| 5 | | Main battery discharged | |

Fig. 3

| <u>Mariner Initiated Alphanumeric Keypad Entries</u> | | |
|--|---|--|
| Navigation Information Key (N) with example codes for operation. | | |
| <u>Code</u> | <u>Condition</u> | |
| 1 | Waypoint modification Float plan (No. and expected t) | |
| 2 | Add new waypoint(s) Float plan (No. and expected t) | |
| 3 | Anchored postion Coord. & expected time | |
| 4 | Weigh anchor Coord. & time | |
| 5 | Provide safe course waypoints Enter target waypoint | |
| Mariner Database Query Key (D) with example codes for operation. | | |
| <u>Code</u> | <u>Condition</u> | |
| 1 | List nearby vessels <i>Miles radius, ID, type, captain</i> | |
| 2 | List nearby on-shore Nav aids <i>Coord - type of signals</i> | |
| 3 | List nearby off-shore Nav aids <i>Coord - type of signals</i> | |
| 4 | List nearby landmarks <i>Miles rad type, signals day/night</i> | |
| 5 | List nearby underwater hazards <i>Miles rad. Coordin type</i> | |
| 6 | Provide a transmit check | |
| 7 | Provide a depth check | |

Fig. 4

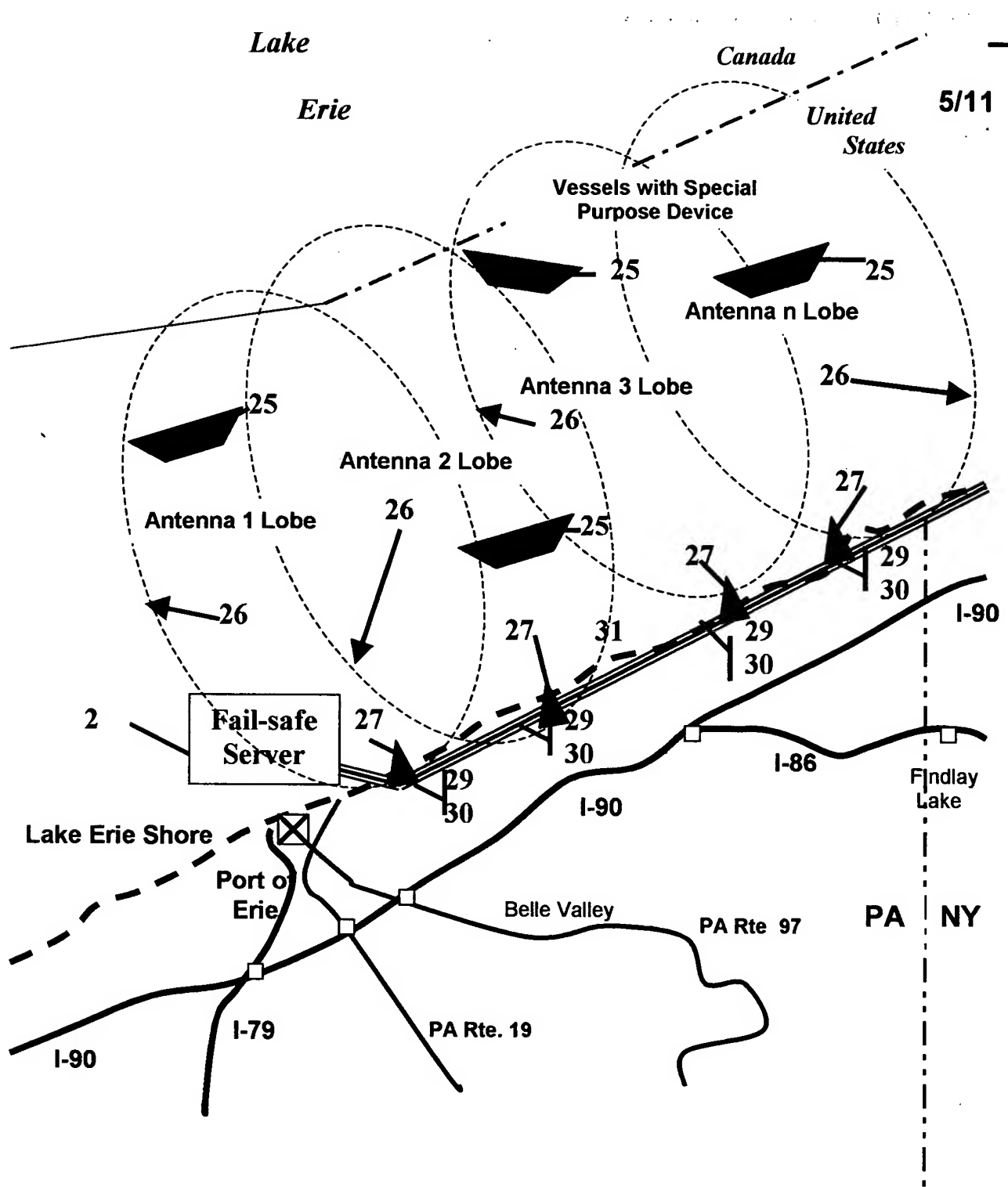


Fig. 5

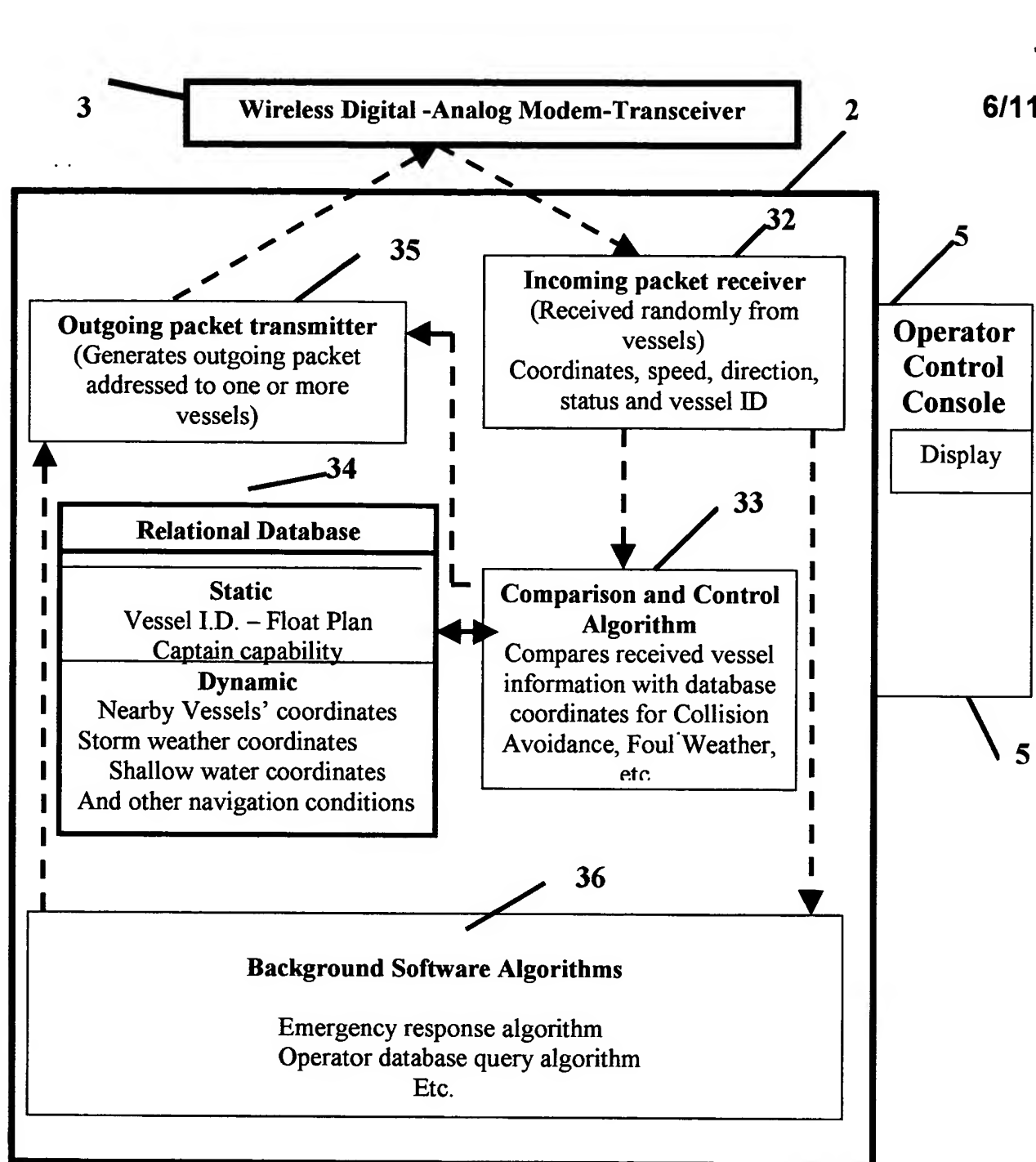


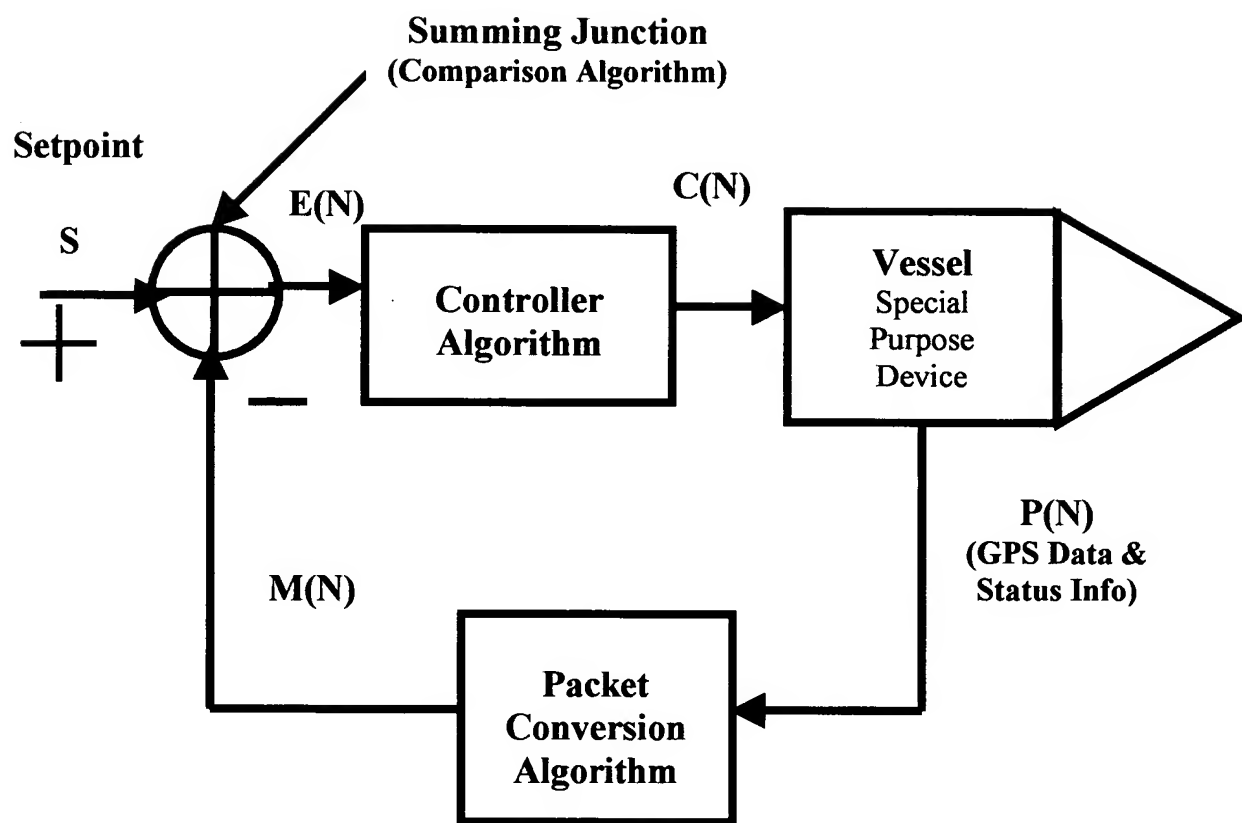
Fig. 6

| | | | | |
|---------------------------|---|--------------------|------------------------|-------------------------|
| | | | | |
| | Per Vessel Table of Static Records in Relational Data Base | | | |
| Vessel ID No. | | | | |
| Owner | Boat Type | Boat Color | Boat Trim | Boat Name |
| Registration No. | Length | Make | Xtra Field | Xtra Field |
| Owner | Name | Address | Phone | Email |
| Coowner #2 | Name | Address | Phone | Email |
| Coowner #2 | Name | Address | Phone | Email |
| Engine Type | No. of Engines | HP each | Fuel Capacity | Fuel Type |
| Survival Equip | PFDs | Flares | Mirror | Dinghy/raft |
| Smoke signals | Flash/spotlight | Food | Anchor | EPIRB |
| Radio | Type | # of Freqs. | Radar | Other |
| Xtra Field | Xtra Field | Xtra Field | Xtra Field | Xtra Field |
| Xtra Field | Xtra Field | Xtra Field | Xtra Field | Xtra Field |
| Float Plan No. | Persons Aboard | | | |
| Pssngr name | Address | Phone no. | Age | Emerg. Contact |
| Pssngr name | Address | Phone no. | Age | Emerg. Contact |
| Pssngr name | Address | Phone no. | Age | Emerg. Contact |
| Pssngr name | Address | Phone no. | Age | Emerg. Contact |
| Pssngr name | Address | Phone no. | Age | Emerg. Contact |
| Pssngr name | Address | Phone no. | Age | Emerg. Contact |
| Pssngr name | Address | Phone no. | Age | Emerg. Contact |
| | | | | |
| Time Leave at | FROM | GOING TO | EXPECT RTN BY | |
| Time at Stop 1 | Where | Going to | Expect Depart T | |
| Time at Stop 2 | Where | Going to | Expect Depart T | |
| Time at Stop 3 | Where | Going to | Expect Depart T | |
| | | | | |
| WAYPOINTS FOR TRIP | | | | |
| 1 | N deg min | W deg min | Date/Mil. Time | X% Course Toler. |
| 2 | N deg min | W deg min | Date/Mil. Time | X% Course Toler. |
| 3 | N deg min | W deg min | Date/Mil. Time | X% Course Toler. |
| 4 | N deg min | W deg min | Date/Mil. Time | X% Course Toler. |
| 5 | N deg min | W deg min | Date/Mil. Time | X% Course Toler. |
| 6 | N deg min | W deg min | Date/Mil. Time | X% Course Toler. |
| 7 | N deg min | W deg min | Date/Mil. Time | X% Course Toler. |
| | | | | |
| | | | | |

Fig. 7

| | | | | | | |
|---------------|---|-------------------------------|-------------------|---------|------------|------------|
| | | | | | | |
| | Table of Dynamic Records in Relational Data Base | | | | | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| Vessel ID No. | Captain | N dms | W dms | Heading | Spd -knots | |
| | | dms = degrees/minutes/seconds | | | | |
| | Front End Point 1 | | Front End Point 2 | | | |
| STORM 1 | N dms | W dms | N dms | W dms | Heading | Spd -knots |
| STORM 2 | N dms | W dms | N dms | W dms | Heading | Spd -knots |
| STORM 3 | N dms | W dms | N dms | W dms | Heading | Spd -knots |
| FOG 1 | N dms | W dms | N dms | W dms | Heading | Spd -knots |
| FOG 2 | N dms | W dms | N dms | W dms | Heading | Spd -knots |
| FOG 3 | N dms | W dms | N dms | W dms | Heading | Spd -knots |
| WATERSPOUT 1 | N dms | W dms | N dms | W dms | Heading | Spd -knots |
| | Front End Point 1 | | Front End Point 2 | | | |
| 4 TO 10 WAVES | N dms | W dms | N dms | W dms | | |
| AREA | Rear End Point 3 | | Front End Point 4 | | | |
| | N dms | W dms | N dms | W dms | | |
| | | dms = degrees/minutes/seconds | | | | |

Fig. 8

**Fig. 9**

| Threat List vs. Setpoint and Origin | | |
|-------------------------------------|---|--------------------------------------|
| | | |
| | | |
| <u>Function</u> | <u>Origin</u> | <u>Setpoint</u> |
| Tracking | GPS (subject vessel) | |
| Radar Equivalent | GPS (vessels near subject vessel) | |
| | | |
| <u>Threat</u> | <u>Origin</u> | <u>Setpoint</u> |
| | | |
| Off Course - Float Plan | Float Plan - Manual Entry | Waypoint (no.,time) envelope |
| Collision | GPS data (threatening vessel) | GPS data (threatening vessel) |
| Restricted Area | GPS data (perimeter endpoints) | Waypoint envelope |
| USN Ship Restriction | GPS data (USN Ship) | Dynamic Waypoint Envelope |
| Severe Storm | NOAA- time-lapse Doppler (Internet) | Storm front width, heading and speed |
| High Waves/Wind | NOAA buoys/Internet | Waypoint Defined Area |
| High Wind | NOAA time-lapse Climatic map (Internet) | Waypoint Defined Area |
| Underwater Obstruction | Charts & Manual Region Update | Waypoint Perimeter |
| Surface Obstruction | Charts & Manual Region Update | Waypoint Perimeter |
| Fog | Manual sighting (etc.) | Waypoint Perimeter |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Fig. 10

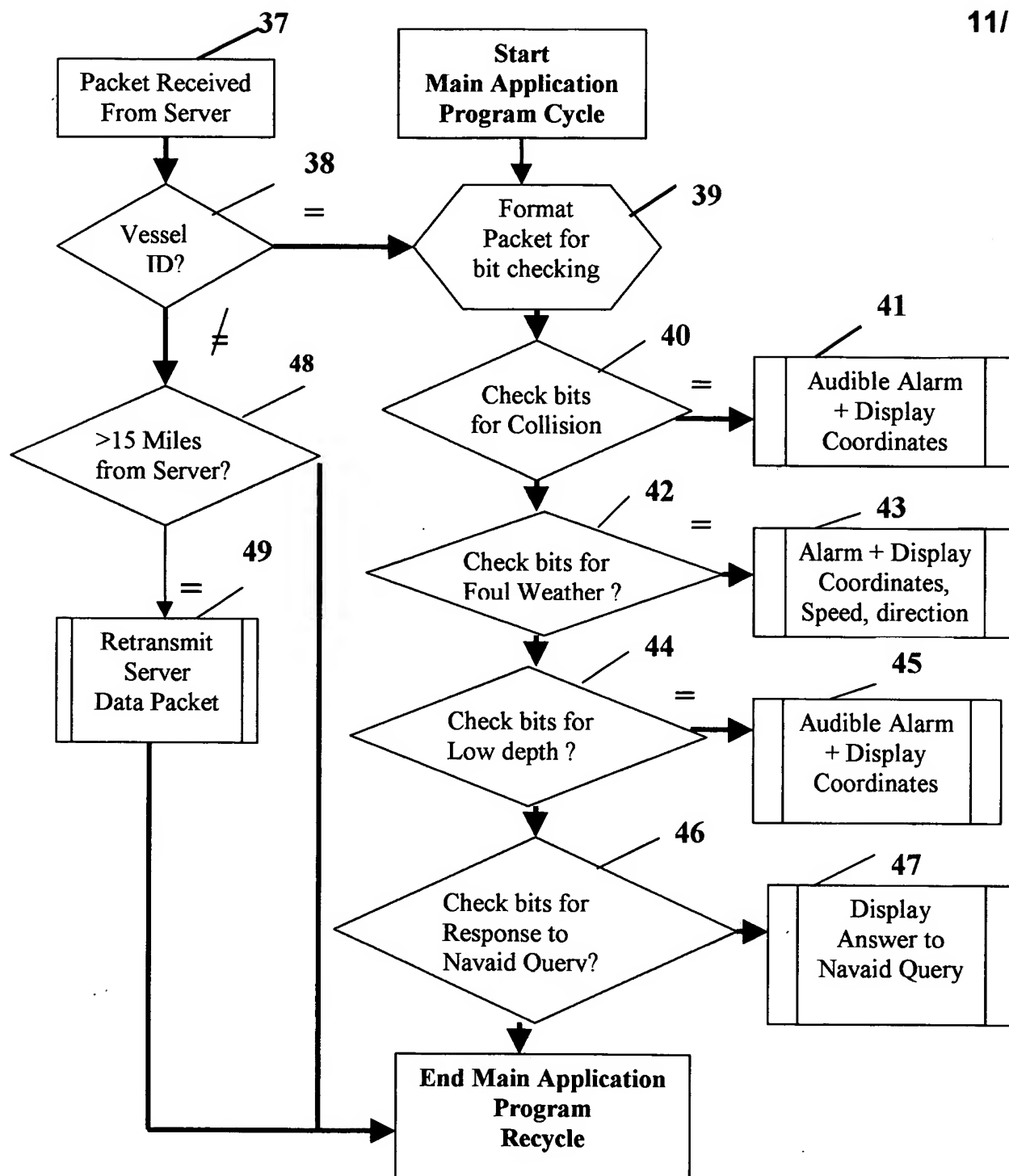
**Fig. 11**

Figure Reference Number vs. Part Name

System and Apparatus for Automatic and Continuous Monitoring, Proactive Warning and Control of One or More Independently Operated Vessels

Inventor: C. David Rogers

| Fig. | No. | Part Name |
|---------|-----|--|
| 1 ↓ | 1 | Not Used |
| | 2 | Fail-safe server |
| | 3 | Wireless/ Analog Modem Transceiver |
| | 4 | Special Purpose Device (GPS/etc.) |
| 2 ↓ | 5 | Sys Admin/Operator Console |
| | 6 | GPS Printed Circuit Board (PCB) |
| | 7 | GPS Integrated Circuit |
| | 8 | Other GPS Integrated Circuits (Ics) |
| | 9 | GPS PCB - Intelligent Display connection |
| | 10 | Intelligent Display Component |
| | 11 | GPS - Power Connection |
| | 12 | Power Distribution & Regulator |
| | 13 | GPS antenna |
| | 14 | Microcontroller |
| | 15 | Microcontroller component - Microprocessor |
| | 16 | Microcontroller component - EEPROM |
| | 17 | Microcontroller component - ROM Memory |
| | 18 | Microcontroller component - Flash EPROM |
| | 19 | Microcontroller component - RAM |
| | 20 | Power connection Intelligent Display/modem |
| | 21 | Digital Wireless Modem/Transceiver |
| | 22 | Wireless Modem/Transceiver Antenna |
| | 23 | Special Purpose Device Serial Connection |
| | 24 | Mariner Alphanumeric Keypad |
| 5 ↓ | 25 | Marine Vessels in Lake Erie |
| | 26 | Wireless Communications Energy Lobes |
| | 27 | Wireless Communications Antennas |
| | 28 | Not Used |
| | 29 | Digital Wireless Access Points |
| 6 ↓ | 30 | Digital Wireless Re-transmitter/receivers |
| | 31 | Leased Land Line Communications (ex. Fiber) |
| | 32 | Packet receiver algorithm |
| | 33 | Comparison and control algorithm |
| | 34 | Oracle relational data base |
| | 35 | Packet transmitter algorithm |
| | 36 | Background software algorithms |
| 11 ↓ | 37 | Software buffer - Packets |
| | 38 | Decision element - Vessel ID |
| | 39 | Application software processor - packet formatting |
| | 40 | Decision element - collision bit check |
| | 41 | Software subroutine - collision alarm procedure |
| | 42 | Decision element - foul weather bit check |
| | 43 | Software subroutine - foul weather alarm procedure |
| | 44 | Decision element - water depth bit check |
| | 45 | Software subroutine - low water depth alarm procedure |
| | 46 | Decision element - Operator NAVAID query bit check |
| | 47 | Software subroutine - display answer to operator query |
| | 48 | Decision element - Vessel 20 mile range |